

congregate. Two tables also show the distribution, in Great Britain and abroad, of the several genera and species; and a short chapter on the "Distribution and Origin of Species" concludes the volume.

*Geological Observations in South Australia; principally in the District south-east of Adelaide.* By the Rev. JULIAN EDMUND WOODS, F.G.S., &c. 8vo. Longman, 1862.

"EVERY country has its history, not alone the history of what its inhabitants said and did, nor how its people lived, conspired, quarrelled, fought, and died, but a history which stretches further back and is buried in more remote antiquity. If it had not been so, Australia might indeed be counted the youngest as well as the least interesting of continents. She has had no people that could describe her vicissitudes, and there are no monuments left to chronicle her changes; but yet her history is written in an imperishable record. Of old, when the first explorers came upon the coast of a newly discovered territory, the rocks, the trees, the soil, and the verdure only spoke to them of one thing, namely, of fertility, or richness, or special adaptation to the wants of man. But now the very coast-line tells much more. Not only is the fertility or barrenness of the place itself told by the rocks, but the explorer is able to guess how far these appearances extend, and whether the country is likely to be fitted for human requirements in the present state of civilization."

These are our author's preliminary observations in his Chapter II.; and he follows them up, 1stly, by pointing out the evidences of former and different physical conditions presented by the existing geographical features of Australia generally; 2ndly, by giving in detail an account of the limestone-beds that form the plains of a great part of Southern Australia, and perhaps of Tasmania, describing their probable origin in a sea occupied by reefs of Bryozoa, as some seas now are by corals; 3rdly, by treating of the extinct volcanos of Mount Gambier and its vicinity, and of their individual and general history; 4thly, by describing the caverns in the limestone of the district under notice, and the underground drainage in connexion therewith.

The conclusions that the author draws from his observations on the geology of the colony are as follows:—

"I. There has been in Australia an immense area of subsidence during the Pliocene period, at a time when Rome, parts of Italy, Vienna, and parts of Austria, Piedmont, and Asia Minor were under the sea. II. This subsidence was accompanied by a [moss-] coral formation, very similar to the subsiding area of the Pacific at the present time; and although all the appearances are those of a reef of true zoophyte corals, the predominant fossil is a massive *Cellepora*, while true corals are rare. III. This gives rise to the suspicion that *Bryozoa* may build reefs and atolls, as well as true Corals. IV. That the subsidence ceased; and probably about that time volcanic disturbance commenced, and gave rise to submarine craters. V. That, after the cooling of the lava from these submarine craters, a deposit of small fragments of shells was thrown down from an ocean-current. VI.

That this became hardened into stone, and was then upheaved from the sea; during which process large portions of it became washed away. VII. That the latter part of the upheaval was separated by a long lapse of time from the subsidence, because the latter strata show some difference in their fauna. VIII. That while upheaval was going on, until very recently, extensive volcanic disturbance took place, giving rise to craters which are now all extinct. IX. That the upheaved [Bryozoan] rock, when decomposed, has given rise to a very different sort of soil, of a sandy character, which causes large tracts of arid, useless country in this part of Australia. X. That the same rock, being of a loose texture, easily allowed water to percolate through, forming caves and underground passages, besides honey-combing the ground in all directions. XI. That, while these operations proceeded, the animal life was of a slightly different character from what is found in the same locality now, though probably the land-animals were not specially different from individuals in other parts of the Australian continent." Lastly, that "these numerous changes seem to have taken place without any vast convulsion of nature, or phenomena different from what happen in the world now."

In discussing the many geological and natural-history points of interest that occur in his work, the author, himself an amateur, often freely explains the elementary basis of his several lines of argument, quoting Lyell, Darwin, Jukes, and others, for the information of his readers as to geological systems, the theories of coral-formations, the nature of coral-reefs, &c.; and his book, thus popularly written, is rendered more readable for the general public than if written with strict technicality; but at the same time we miss a requisite scientific accuracy, especially as to zoological nomenclature and classification, without which no geological work can have a high scientific value,—though certainly a hard-working amateur in so distant and isolated a position as Penola must surely be excused for this short-coming.

Some observations by Mr. Woods on extensive recent accumulations of minute organisms, such as *Cypridæ*, *Diatomaceæ*, and *Charæ*, and of mammalian bones and of lake-shells in South Australia, are to be found in Chapter III., and must prove highly suggestive to geologists. The notes on the bone-breccia and accumulations of bones in caves, in Chapter XI., will also attract attention. The author's explanation of the origin of the limestone "Biscuits" of the "Honeysuckle flats" (pp. 43–45) is very ingenious; and his other numerous observations on the physical features of the district, which have been "the occupation of many a passing hour in the bush, where amusements are otherwise few," are full of interest and value.

In his Introductory Chapter and elsewhere, the author has taken care to point out what others have already done in explaining the geological features of Southern Australia; but he has overlooked the little work 'On the Geology and Mineralogy of South Australia,' by Mr. T. Burr, published at Adelaide in 1846.